DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to a tablet filling apparatus and the tablet filling apparatus which has the feature in the supplying form of a tablet container especially.

[0002]

[Description of the Prior Art]After detecting a direction for the tablet container supplied from a tablet container feed zone as a tablet filling apparatus and making an opening go up conventionally, it holds to the attaching part of the disk periphery established pivotable, and there are some which are filled up with a tablet (refer to JP,11-70901,A).

[0003]

[Problem(s) to be Solved by the Invention]However, in said tablet filling apparatus, in order to detect the direction of the opening of a tablet container, to change a direction and to hold by a disk further, the respectively separate independent mechanism is required. For this reason, structure is complicated and there is a problem that cost starts.

[0004]Then, this invention makes it a technical problem to provide the tablet filling apparatus which can supply a tablet container with easy and cheap composition.

[0005]

[Means for Solving the Problem]In a tablet filling apparatus which fills up with this invention a tablet container to which a tablet supplied from a tablet feed zone is supplied from a tablet container feed zone as said The means for solving a technical problem, Reciprocation moving is linearly possible to a container supporting position which receives and supports a tablet container supplied from said tablet container feed zone, and a tablet feeding position where a tablet supplied from said tablet feed zone is thrown in, A container support member which has a supporter of a letter of a fork is provided, and a flange of a tablet container supplied from said tablet container feed zone is supported by said supporter.

[0006]Even if that supply is performed from which direction of an opening side or the bottom side, by a supporter, a flange is supported and, as for a tablet container supplied from a tablet container feed zone by this composition, an opening is certainly positioned up.

[0007]When it has a label stuck part which sticks a label on a peripheral face by guiding and rotating a tablet container supported with said supporter, it is desirable at a point that a dead space generated with allocation of a supporter can be used effectively.

[0008]When said supporter is formed at a different interval according to a difference in size of a tablet container supplied from said tablet container feed zone, it is desirable at a point that it can respond to various tablet containers by slight improvement.

[0009]A hoisting member which makes it go up and down a tablet container supported to said

supporter, and a tablet supplied from said tablet feed zone may be stored temporarily, and it may have further a tablet filling portion with which a tablet container which upper-**(ed) by said hoisting member is filled up.

[0010]

[Embodiment of the Invention]Hereafter, the embodiment concerning this invention is described according to an accompanying drawing.

[0011]This invention is characterized by a tablet filling apparatus comprising the following. The storage rack 1 formed in the profile and end side as shown in drawing 1.

The tablet feed zone 2 provided in the upper part side.

The tablet container feed zone 3 provided in the lower part side.

The storage rack 1, the tablet filling portion 4 provided between the tablet container feed zones 3, and the control section 5 (refer to drawing 17).

[0012]The storage rack 1 is an approximately semi-cylindrical shape-like thing which has two or more chamber houses 6. As shown in drawing 2 (a), each chamber houses 6 are frame shape, and the opposed face of the diameter direction (the drawing 2 (a) Nakaya seal shows.) is carrying out the opening at least. The opening of the diameter direction inside is closed by the door 6a energized by the spring etc. which are not illustrated. The door 6a has prevented invasion of the hand to the filling container transportation part 13 mentioned later by being provided only in the front-face side rotatable. The door 6a is rotated in the range in which it does not interfere in the tablet container 11 held at the container attaching part 8. The indicator 7 is formed in the upper part by the side of the outside diameter direction of the chamber houses 6. this embodiment -- the indicator 7 -- a feeder container number and a tablet -- calculation is displayed. The container attaching part 8 is formed in the chamber houses 6. This container attaching part 8 energizes the retainer board 9 of the horizontal couple provided removablely to direction opposing with the spring 9a. The holding claw 10 which extends in direction opposing is formed in the lower end part of the retainer board 9. As shown in drawing 2 (b), the approximately elliptical crevice 10a is formed so that the tablet container 11 can be held, and the notch 10b which spreads toward the inner circumference side is formed in the opposed rim of each holding claw 10. This notch 10b is for making easy insertion of the tablet container 11 to the crevice 10a. It is detectable by the container sensor 8a whether the tablet container 11 is held by the container attaching part 8 of each chamber houses 6.

[0013]As shown in drawing 1, the touch panel 12 is formed in the peripheral center of said storage rack 1 instead of the chamber houses 6. This touch panel 12 is for making possible the direct entry of formula indicative data.

[0014]The filling container transportation part 13 is allocated in the inner circumference side of said storage rack 1. The filling container transportation part 13 forms the arm member 15 in the

rectangular frame object 14 which can move up and down freely, enabling free revolution, as shown in drawing 3.

[0015]The bearing recess 16 is formed in the both-outsides side of said rectangular frame object 14 at the upper-and-lower-ends part, respectively. The bearing recess 16 ****s the guide shaft 17 made to set up with a prescribed interval behind the storage rack 1. And the up-and-down motion of the filling container transportation part 13 is enabled via a belt (not shown) by driving a motor (not shown). The 1st driving gear 18 is being fixed to the center of the lower part side horizontal plate 14a of said rectangular frame object 14. Said bearing recess 16 may constitute said guide shaft 17 from the ****ing roller and bearing.

[0016]Said arm member 15 is provided with the arm main part 19 allocated in the medial axis of said 1st driving gear 18 enabling free rotation. The 1st drive motor 20 is allocated in the end part of the arm main part 19. The axis of rotation of the 1st drive motor 20 is projected from the undersurface of the arm main part 19, and the position detecting plate 21, and said 1st driving gear 18 and the 2nd meshing driving gear (not shown) are being fixed there. The rotary place of the 2nd driving gear can be distinguished by detecting the position detecting plate 21 by a sensor (not shown). Thereby, the arm member 15 rotates reciprocally in 180 degrees by the drive of the 1st drive motor 20. The sliding member 22 which carries out reciprocation moving to a longitudinal direction by the drive of the 2nd drive motor (not shown) to build in is allocated by the upper surface of the arm main part 19. The gripping member 23 is formed in the end part (it is an opposite hand in said 1st drive motor 20) of the sliding member 22. The gripping member 23 comprises the holding piece 25 of the couple opened and closed via the screwed shaft which is not illustrated by the drive of the 3rd drive motor 24 allocated on the sliding member 22. The 3rd drive motor 24 drives or stops based on the current value changed by the difference in load which acts on the holding piece 25. Concretely, the 3rd drive motor 24 stops [when grasping the tablet container 11 with the holding piece 25, or], when opening the holding piece 25, and load increases, and a current value exceeds a threshold (value which added margin current to the current value which flows at the time of normal operation). The increase in the load at the time of opening the holding piece 25 has been acquired by making the holding piece 25 contact the supporter which is not illustrated in a predetermined open position. The holding piece 25 is energized by the opening direction with the spring etc. which are not illustrated, and the backlash of said screwed shaft is absorbed.

[0017]The tablet feed zone 2 comprises the tablet seat part 26 and the tablet transportation part 27.

[0018]The tablet seat part 26 forms the common guide passage 31 by installing the slot 29 which extends on both sides of the vertical wall section 28 in a sliding direction side by side, respectively, and blockading, respectively by the shelf member 30 provided focusing on the pivot 30a of each slot 29 enabling free rotation, as the part is shown in drawing 4. Two or more

tablet outlets 30b are drilled in a sliding direction by each shelf member 30, and, outside, the motor base 32 is attached corresponding to each tablet outlet 30b, respectively.

[0019]As shown in drawing 5 and drawing 6, the motor base 32 contained the drive motor 32a, and the driving gear 33 which the power of said drive motor 32a is delivered has exposed it to the upper surface. The fall guide passage 34 is formed in the end side of the motor base 32. The tablet detection sensor 35 is formed in the wall of this fall guide passage 34, and the tablet discharged by passing through the fall guide passage 34 can be detected now to it (calculation).

[0020]The feeder container 36 is removably attached to said motor base 32. The opening of the feeder container 36 is carried out to the upper part, it is the approximately rectangular parallelepiped shape which can cover with the covering 37, and the tablet is accommodated in the inside. The rotor 39 which has the gear 38 in a lower end is formed in the bottom of feeder container 36.

[0021]If the rotor 39 has a conic surface up and down as shown in drawing 7, and said motor base 32 is equipped with the feeder container 36, the gear 38 will gear with the gear 33 of said motor base 32. The tablet guide groove 40 which becomes spiral toward a center, and the pass partition groove 41 carried out in the center for 2 minutes are formed in the lower part conic surface of the rotor 39. The hand of cut (an arrow shows among drawing 7 (b).) of the direction of a whorl of the tablet guide groove 40 is a counter direction toward the center of rotation of the rotor 39. The partition fin 42 is allocated in the pass partition groove 41, and as shown in drawing 6 (b), each tablet which passes through the tablet guide groove 40 with rotation of the rotor 39 is classified one by one.

[0022]On the gear 38 of said feeder container 36, the gear stopper 43 is removable. As shown in drawing 5 (b), the gear stopper 43 is energized by the stopper spring 44 at the gear 38 side. Since the gear stopper 43 engages with the gear 38 and rotation of the rotor 39 is prevented by this even if it removes the feeder container 36 from the motor base 32, a tablet does not fall outside.

[0023]In said tablet feed zone 2, if the drive motor 32a in the motor base 32 is driven where the feeder container 36 is attached to the motor base 32, the rotor 39 will rotate via the gear 33 and the driving gear 38, and a tablet will go to a center of rotation by a single tier via each tablet guide groove 40. Since the direction of a whorl of the tablet guide groove 40 is formed toward the center of rotation of the rotor 39 as mentioned above so that it may become the hand of cut with a counter direction, a tablet is compulsorily moved toward a center of rotation irrespective of the centrifugal force which acts on a tablet with rotation of the rotor 39. It is divided by the partition fin 42 and a tablet falls one piece at a time to the common guide passage 31 via the fall guide passage 34, before entering in the tablet guide groove 40.

[0024]The shutter 43 for once holding the tablet which has fallen is formed in the lower end of

the common guide passage 31. The shutter 43 consists of one board horizontally slid to the dropping direction of the fall guide passage 34. The openings 43a and 43b are formed in the both ends of the shutter 43, respectively. If the shutter 43 slides to a left end, the opening of the fall guide passage 34 will be carried out by the right-hand side opening 43a, and if it slides to a right end, the opening of the fall guide passage 34 will be carried out by the left-hand side opening 43b. If the shutter 43 stops in the center section of the slide stroke, both the fall guide passages 34 will be closed.

[0025]moreover -- the lower part of the shutter 43 -- the hopper 44 -- a slide -- and it is provided removable. The hopper 44 is slid to the position which can receive a tablet according to the slide operation of said shutter 43. And supply of the tablet received from said each fall guide passage 34 is enabled respectively at the transportation vessel 46 of the two tablet transportation parts 27 provided in the lower part of the hopper 44.

[0026]The tablet transportation part 27 builds over the transportation belt 48 between the rollers 47 of a couple, is what made possible reciprocation moving of the transportation vessel 46 with this transportation belt 48, and is provided by two rows. The transportation vessel 46 is supported with the supporting frame body 46a. The rectangular hole 46c is installed in the bottom plate part 46b of the supporting frame body 46a side by side (refer to drawing 4, drawing 14, and drawing 15). Said transportation belt 48 has the continuous guide projected rim part 48a. This guide projected rim part 48a engages with said rectangular hole 46c, and makes the transportation vessel 46 transportable. The transportation vessel 46 comprises the shutter 49 which can open and close the undersurface. The shutter 49 is energized so that the bottom of the transportation vessel 46 may be blockaded with the spring 50 allocated in the end side. The lobe 49a is formed in the end side undersurface of the shutter 49.

[0027]The stock container 51 in which the tablet container feed zone 3 accommodates the empty tablet container 11 as shown in drawing 8 and drawing 9, It comprises the container extraction part 52 which picks out every one tablet container 11 from this stock container 51, and the empty container transportation part 53 which conveys the tablet container 11 picked out from the stock container 51 by this container extraction part 52. The tablet container feed zone 3 is installed in a single tier side by side, and the tablet container 11 of the sky where sizes (an outer diameter or length) differ, respectively is accommodated in each stock container 51, respectively.

[0028]The bottom wall 54 of said stock container 51 inclines caudad toward the container extraction part 52, and the turntable 55 is allocated near the container extraction part 52. The turntable 55 is projected a little from the bottom wall 54, and changes the slope direction of positive and the tablet container [as opposed to / rotate reversely and / the container extraction part 52] 11 periodically by the drive of the motor 56. The hemispherical projection 55a is formed in the upper surface of the rotor plate 55. This projection 55a helps smooth

drawing by the container extraction part 52 by making the tablet container 11 sideways. The transmission type photosensor 54a is attached above the inclined plane of the bottom wall 54. The indicator lamp (not shown) formed in the stock container 51 displays the storage residue of the tablet container 11 based on the detecting signal in the transmission type photosensor 54a. That is, an indicator lamp turns on the "F" lamp, when the light between the transmission type photosensors 54a is intercepted, and when not intercepted, it turns on the "L" lamp. An indicator lamp turns on the "E" lamp, when the sensor formed in the conveying base 62 mentioned later cannot carry out fixed time detection of the tablet container 11. It may be made to display the storage residue of said tablet container 11 on the touch panel 12 shown in drawing 1.

[0029]Said container extraction part 52 builds over the belt 58 between the rollers 57 allocated up and down, as shown in drawing 10. In accordance with the move direction, the horizontal container attaching part 59 is formed in the belt 58 with the prescribed interval. Between each horizontal container attaching part 59, the vertical container exclusion part 60 is formed in two places. The horizontal container attaching part 59 comprises two or more holding claws 59a which project with a prescribed interval, and the vertical container exclusion part 60 comprises two or more heights 60a which project with a prescribed interval. The interval of each horizontal container attaching part 59 is smaller than the height measurement of the tablet container 11, and larger than an outside diameter size. The interval of each holding claw 59a is larger than the outside diameter size of the tablet container 11. It is possible to hold the tablet container 11 sideways certainly by this, without catching the opening of the tablet container 11 in the holding claw 59a.

[0030]As shown in drawing 8, said container extraction part 52 is further provided with the conveyor 61 and the conveying base 62, and conveys the tablet container 11 taken out by said container extraction part 52 to the empty container transportation part 53. The conveyor 61 builds over the conveyance rope 59 of four convenience between the rollers 68 of a couple. The roller 68 can rotate reciprocally by the drive of the motor which is not illustrated. The interval of the conveyance rope 69 is a value smaller than the outer diameter of the tablet container 11 conveyed at least. The conveying base 62 is section abbreviation L type, and transports the tablet container 11 which rotated between the positions shown with a solid line and a two-dot chain line among drawing 9 by the drive of the solenoid which is not illustrated, and was conveyed by conveyor 61 to the empty container transportation part 53. Said container extraction part 52 is driven when the tablet container 11 on the conveyor 61 is not detected by the sensor which is not illustrated. Said empty container transportation parts 53 will be collected to the recovering box which does not illustrate this, if fixed time and a transportation direction were reversed and the empty tablet container 11 has stopped on the way at the time of power supply starting from an initial power up or a scram.

[0031]Said empty container transportation part 53 is allocated under the conveying base 62 along with the stock container 51 installed side by side. This empty container transportation part 53 comprises the roller 71 of a couple, and the conveyance rope 72 of the couple over which those both ends were built, respectively like said transportation part 66.
[0032]The tablet filling portion 4 is provided with the following.
As shown in drawing 11, it is the container supporter 76 of the letter of a fork.
Tablet metering zone 77.

[0033]Said container supporter 76 has two or more holding pieces 78, and supports the tablet container 11 between each. The interval of each holding piece 78 supports the size of the tablet container 11. In this embodiment, it is possible to the container supporter 76 to hold the tablet container 11 of S, M, and L size. The container supporter 76 carries out reciprocation moving of between a container supporting position and tablet feeding positions with the drive which is not illustrated.
[0034]The guide plates 79, 80, and 81 are formed near the container supporting position. The first guide plate 79 is approximately V type, and leads the tablet container 11 conveyed from the empty container transportation part 53 to the second guide plate 80. In the container supporter 76, the second guide plate 80 inclines the tablet container 11 so that supply is possible. The third guide plate 81 moves to the second guide plate 80, and carries out permission or denial of the supply of the tablet container 11 to the container supporter 76. The third guide plate 81 may equip the back side with the sending-out guide plate from the transmission direction so that the tablet container 11 may roll certainly.
[0035]The container aligning plate 82 is allocated under the container supporter 76. When the container aligning plate 82 carries out horizontal migration of the container supporter 76, it is aligned at a single tier in contact with the tablet container 11 supported with each holding piece 78. It becomes possible for this to stop an extrusion outlet with the extrusion roller 92 mentioned later, and to make efficient operation perform.
[0036]Near the tablet feeding position, the label sticking device 83 and the lifter 84 are formed.
[0037]The label sticking device 83 prints a drugs name etc. on a label, and sticks them on the tablet container 11. The label 85 is stuck on the sheet 87 supplied from one roller 86a, and when a direction is changed into the sheet 87 by the guide tips 88, it separates. The sheet 87 removed in the label 85 is rolled round by the roller 86b of another side. Printing to the label 85 is performed by carrying out hot printing of the ribbon 90 by the print head 89, being supported by the backing strip roller 86c before being removed from the sheet 87. The ribbon 90 is supplied from one roller 91a, and is rolled round by the roller 91b of another side.
[0038]Under said container supporter 76, the extrusion roller 92 and the guide idler 93 of the couple are allocated. Between the extrusion rollers 92, the size detection sensor (not shown)

for detecting the size of the tablet container 11 is formed. The extrusion roller 92 extrudes the tablet container 11 aligned with the container aligning plate 82 to the projection direction of the holding piece 78, and holds the tablet container 11 with the guide idler 93 located in the opposite hand. The rotation cradle 110 is formed under the tablet container 11 held by the extrusion roller 92 and the guide idler 93. This rotation cradle 110 goes up to the height according to the detection size in said size detection sensor. The guide idler 93 is energized at said extrusion roller 92 side, and rotates the tablet container 11 by the drive of the motor 93a.

[0039]The lifter 84 is raised to the rotary place in which the flange is located up a little rather than the holding piece 78 in the tablet container 11, and the tablet filling position which lifts even the restoration hopper 97 mentioned later.

[0040]Said tablet metering zone 77 is provided with the injecting hopper 94, the metering zone 95, the scale hopper 96, the restoration hopper 97, and the discharge hopper 98.

[0041]In the injecting hopper 94, if said transportation vessel 46 moves as shown in drawing 15, when the lobe 49a of the shutter 49 contacts an edge, the energizing force of the spring 50 will be resisted and the shutter 49 will be opened. Thereby, the tablet accommodated in the transportation vessel 46 falls to the injecting hopper 94 one by one.

[0042]The metering zone 95 consists of the graduated cylinder 99 which accommodates the tablet which falls from the injecting hopper 94, the measuring instrument 100 measured with the tablet which had this graduated cylinder 99 accommodated, and the arm 101 of the couple which supports said graduated cylinder 99, as shown in drawing 11. Two projections 99a and 99b are formed in the both-sides outside surface of the graduated cylinder 99, respectively. The locking recess 101a by which the projection 99a by the side of an end is stopped is formed at the tip of the arm 101. When this locking recess 101a rotates the arm 101 and supplies the tablet in the graduated cylinder 99 to the restoration hopper 97, in order to prevent omission of the projection 99a of said graduated cylinder 99, it is formed in the key type. When a tablet is fed into the graduated cylinder 99 from the injecting hopper 94, said arm 101 is supported in the state where the graduated cylinder 99 was floated from the measuring instrument 100 so that the impulse force may not act on the measuring instrument 100 directly, and it is rotated so that the graduated cylinder 99 may be laid on the measuring instrument 100 after that. Thereby, the metering time by the measuring instrument 100 is shortened.

[0043]It comprises the shutter 96a, the fill ration detection sensor 102 is allocated by the opposed side, and the bottom of the scale hopper 96 can distinguish the amount of tablets stored in the scale hopper 96.

[0044]The upper opening of the restoration hopper 97 and the discharge hopper 98 is opened and closed with the opening and closing door 103 provided enabling free rotation. The restoration hopper 97 serves as the shape with the stage where the lower part tubed part 110 makes an inside diameter small gradually as shown in drawing 14, and the container liner 111

is allocated there, enabling free up-and-down motion. The umbrella part 112 is formed in the upper part of a container liner, and the inner direction opening 110a of the lower part tubed part 110 is opened and closed. If the tablet container 11 is made to upper-** and a container liner is pushed up by said lifter 84 by this, the tablet held by the umbrella part 112 will be supplied in the tablet container 11.

[0045]The control section 5 receives the input of prescription information from the host computer 105 (input signal in the touch panel 12), as shown in drawing 17, the storage rack 1 (container sensor 8a, touch-panel 12, motor 14a, 1st drive-motor 20, 3rd drive-motor 24 grade) tablet feed zone 2 (the drive motor 32a.) A signal is received from tablet detection sensor 35 grade, the tablet container feed zone 3, the tablet filling portion 4 (the measuring instrument 100, fill ration detection sensor 102 grade), and emergency stop switch 106 grade, and drive controlling is carried out.

[0046]Next, operation of the tablet filling apparatus of said composition is explained.

[0047]As shown in the flow chart of drawing 18, the formula indicative data based on prescription data is first received from the host computer 105 (Step S1). And based on this formula indicative data, an empty container provisioning process (Step S2) and tablet transfer processing (Step S3) are performed by parallel concurrent processing. Then, after performing tablet filling treatment (step S4), container transfer processing in which the tablet container 11 is transported to the chamber houses 6 of the storage rack 1 is performed (Step S5). Two or more formula indicative data may be received according to throughput.

[0048]As an empty container provisioning process is shown in the flow chart of drawing 19 and drawing 20, the container extraction part 52 of the stock container 51 in which the tablet container 11 applicable based on said formula indicative data is accommodated first is driven (Step S11). In the container extraction part 52, the tablet container 11 is conveyed upwards by the horizontal container attaching part 60 in the state where it was held sideways. The tablet container 11 has it prevented by the horizontal container attaching part 60 by the vertical container exclusion part 61 at this time longitude or that two are laminated. [the time of determining use of the tablet container 11 held at the container supporter 76], i.e., when the following formula indicative data is inputted, supply of the following tablet container 11 is performed by driving the container extraction part 52 of the stock container 51.

[0049]If the tablet container 11 is carried upwards by said container extraction part 52, the drive of the conveyor 61 will be started and it will be made to move to the conveying base 62 (Step S12). And the tablet container 11 is transported to the empty container transportation part 53 by driving the solenoid which is not illustrated and rotating the conveying base 62 (Step S13).

[0050]In the empty container transportation part 53, it waits for expenditure of the tablet container 11 from said stock container 51, a motor is driven, and the tablet container 11 is

conveyed to the tablet filling portion 4 with the conveyance rope 72 (Step S14).

[0051]In the tablet filling portion 4, the tablet container 11 is led to the second guide plate 80 with the first guide plate 79, and it guides with the third guide plate 81 there (Step S15). Horizontal migration of the container supporter 76 is carried out, and the holding piece 78 of a couple according to the size of the tablet container 11 conveyed is positioned to the lower edge section of the second guide plate 80 (Step S16). And the third guide plate 82 is moved and the tablet container 11 is supported with the holding piece 78 of the container supporter 76 (Step S17). Thereby, the tablet container 11 will be in the state where the flange was supported and the opening was always carried out toward the upper part.

[0052]In this case, the supporting position in the holding piece 78 is greatly different by the size and the supply direction of the tablet container 11. Then, the movement will be suspended, if a tablet filling position is reached after carrying out horizontal migration of the container supporter 76 and aligning the tablet container 11 with the container aligning plate 82 (Step S18) (Step S19) (Step S20). And (Step S22) and the tablet container 11 are held with the extrusion roller 92 and the guide idler 93 by driving the lifter 84, making the tablet container 11 ** on some from the container supporter 76 (Step S21), and advancing the extrusion roller 92 in this state. And a guide idler is rotated by the drive of the motor 92, and the label which performed predetermined printing is stuck on the peripheral face of the tablet container 11 (Step S23).

[0053]On the other hand, in tablet transfer processing, as shown in the flow chart of drawing 20 and drawing 21, drive controlling of the tablet seat part 26 applicable based on formula indicative data is carried out. That is, the built-in motor of the applicable motor base 32 is driven, and only a predetermined number makes the tablet accommodated in the feeder container 36 discharge by rotating the rotor 39 (Step S41). An ejecting number is counted by the tablet detection sensor 35 formed in the fall guide passage 34 (Step S42). In this way, if the tablet of a predetermined number is discharged by the common guide passage 31 via the fall guide passage 34 from the feeder container 36 (Step S43), rotation of the rotor 39 will be suspended and discharge of a tablet will be stopped (Step S44).

[0054]Drive controlling of the tablet transportation part 27 is carried out. That is, the transportation vessel 46 is located down the common guide passage 31 via the transportation belt 48 by rotating the roller 47 (Step S45). And the hopper 44 is rotated, the opening is oriented with the transportation vessel 46 (Step S46), and a tablet is accommodated in the transportation vessel 46 by opening the shutter 49 (Step S47).

[0055]Thus, if predetermined number accommodation of the tablet applicable in the transportation vessel 46 is carried out, the transportation vessel 46 will be moved to the injecting hopper 94 by carrying out drive controlling of the tablet transportation part 27 (Step S48). At this time, when the lobe 49a of the shutter 49 contacts the edge of the injecting

hopper 94, the shutter 49 opens wide gradually with movement of the transportation vessel 46, and the accommodated tablet is accommodated in the graduated cylinder 99 via the injecting hopper 94. It changes into the state where rotated the arm 101 and the graduated cylinder 99 was floated a little from the measuring instrument 100, and the impulse force accompanying a tablet injection is kept from carrying out a direct action to the measuring instrument 100 at this time. Then, the arm 101 is rotated, the graduated cylinder 99 is laid in the measuring instrument 100, and weight is measured (Step S49).

[0056]Then, it is judged whether it is specified weight (Step S50). The arm 101 is rotated (Step S51) and a tablet is accommodated in the scale hopper 96. And based on the detecting signal from the fill ration detection sensor 102 of the scale hopper 96, the tablet judges whether it is the capacity which can be accommodated in the tablet container 11 (Step S52).

[0057]Weight is a predetermined value, and if capacity is below the specified quantity, an applicable tablet will be judged to be in the state which can be filled up only with the specified quantity. Then, the container liner 111 of the restoration hopper 97 is pushed up by raising the tablet container 11 further by the lifter 84 (Step S53). Thereby, the inner direction opening 110a by the umbrella part 112 carries out an opening, and it fills up with a tablet in the tablet container 11.

[0058]It judges that weight is not a predetermined value, or it is not a tablet applicable if it is over prescribed capacity, or is the capacity with which the tablet container 11 cannot be filled up, the opening of the restoration hopper 97 is blockaded (Step S54), and the shutter 96a is opened (Step S55). Thereby, a tablet is discharged via the discharge hopper 98. In this case, it returns to Step S41 and tablet transfer processing is performed again.

[0059]If the tablet container 11 is filled up with a tablet, transfer processing to the storage rack 1 will be performed. At this time, the operating condition of the chamber houses 6 is checked with a storage rack data table, and the vacant chamber houses 6 are pinpointed. A storage rack data table is formed based on the detecting signal in the container sensor 8a formed in each chamber houses 6 of the storage rack 1. And the position which transports the tablet container 11 among the vacant chamber houses 6 is determined. Here, a worker determines a transferring location as the order which is easy to take out the tablet container 11.

[0060]If the chamber houses 6 to which the tablet container 11 is transported are determined, the arm member 15 will be rotated (Step S61), the sliding member 22 will be advanced to the arm main part 19 (Step S62), and the tablet container 11 will be grasped with the holding piece 25 (Step S63). And the sliding member 22 is retreated (Step S64), and the arm member 15 is rotated and it is made to go up (Step S65). The rotating position and ascending position of the arm member 15 are the chamber houses 6 where the worker who determined as mentioned above tends to take out the tablet container 11.

[0061]If movement to the rotating position and ascending position which the arm member 15

determined is completed (Step S66), the accommodation state of the chamber houses 6 will be checked based on the detecting signal from the container sensor 8a again formed in the applicable chamber houses 6. When the tablet container 11 is not accommodated, by advancing the sliding member 22, the door 6a is opened wide and the grasped tablet container 11 is moved to the chamber houses 6 of the storage rack 1 (Step S67). The tablet container 11 is located in the crevice 10a, extending the retainer board 9 in the chamber houses 6 on both sides by the notch 10b formed in the holding claw 10, and is held by the energizing force of the spring 9a. Then, after opening the holding piece 25 wide (Step S68) and retreating the sliding member 22 (Step S69), downward moving of the arm member 15 is carried out (Step S70), and it prepares for a transfer of the following tablet container 11. However, when detected just before accommodation in the chamber houses 6 in which it is going to accommodate the tablet container 11, the chamber houses 6 in which another accommodation is possible are searched again, and it retransports to the chamber houses 6.

[0062]Selection of the chamber houses 6 to which it is made to move may attach a number sequentially from the shortest thing of the transfer time of the tablet container 11 by the arm member 15, and may choose what has the smallest number among the vacant chamber houses 6.

[0063]thus, the indicator 7 of the chamber houses 6 applicable based on the detecting signal from the container sensor 8a if the tablet container 11 in which specified quantity restoration of the predetermined tablet was carried out is transported to the chamber houses 6 of the storage rack 1 -- a feeder container number and a tablet -- calculation is displayed (Step S71).

[0064]By the way, after the tablet container 11 is conveyed as mentioned above and a predetermined tablet is filled up with said tablet filling apparatus there, are transported to the chamber houses 6 of the storage rack 1, but. If an emergency stop button (provided in the lower end center part of the storage rack 1 and the center section of the tablet container feed zone 3, respectively.) is pushed during the work of these series or supply of a power supply stops by interruption to service etc., a tablet filling apparatus will stop. In this case, the energization to the motor base 32 which drives the tablet seat part 26 is stopped, and incorrect fall of a tablet is prevented. However, it does not stop but the energization to the control section 5 transmits that it is in an emergency stop state. In the stop of the usual current supply, after stopping the energization to the motor base 32 previously, without stopping simultaneously the energization to the motor base 32 and the control section 5, the energization to the control section 5 is stopped. When an emergency stop button is pushed or supply of a power supply stops by interruption to service etc., since the control section 5 can receive an electric power supply also from the secondary power supply which is not illustrated, it maintains a driving state, but it may be unable to be thoroughly grasped about the information about the tablet container 11 or tablet under conveyance. For this reason, it will be

necessary to perform restoration processing which once collects and resets the tablet container 11 and tablet in the middle of conveyance.

[0065]In the restoration processing shown below, since the tablets and the tablet containers 11 which stopped in the middle of conveyance are collected to the chamber houses 6 of the storage rack 1, the tablet container 11 is removed from the chamber houses 6 so that restoration processing may become possible, when there is no opening in the chamber houses 6 of the storage rack 1, or there are few openings. In the conveying path (the empty container transportation part 53, container supporter 76 grade) of the tablet container 11, the fixed time inversion of the empty container transportation part 53 is carried out, and the tablet container 11 on the empty container transportation part 53 is removed. In the container supporter 76, the size data of the tablet container 11 is again memorized by the size detection sensor which was formed between the extrusion rollers 92 and which detects the size of the tablet container 11.

[0066]It is preferred to display to remove a tablet on said touch panel 12. Since an error when the tablet in the feeder container 36 and the tablet container 11 in the stock container 51 are empty is not what shows abnormalities, restoration processing is not performed.

[0067]Here, said restoration processing is explained according to the flow chart of drawing 23.

[0068]First, the power supply of the control section 5 is once made into an OFF state (Step S81). This is for eliminating the data under processing memorized temporarily [memory / of the control section 5]. A power supply by pressing the portion displayed on the touch panel 12 as "CLOSE", as shown in drawing 25 (a), By making it display it as "DO YOU WANT TO POWEROFF?" shown in drawing 26 (a), and choosing "YES" among the "YES", [NO" which are displayed caudad, It turns off, after making it display "it be safe even if it disconnects a power supply". [which is shown in drawing 26 (b)]

[0069]Next, if the emergency stop button which is not illustrated is pushed (Step S82), after resetting this (Step S83), the power supply of the control section 5 will be again made into an ON state (Step S84). Thereby, as shown in drawing 25 (a), it is displayed on the touch panel 12.

[0070]If pressing operation of the "RECALL" is carried out among the items displayed on the touch panel 12 as shown in drawing 25 (a) (Step S85), the collection processing of the tablet in the middle of supply will be started in response to the input signal (Step S86). At this time, it is displayed on the touch panel 12 as "RECALL UNDER PROCESS --" shown in drawing 26 (b), and reports that it is during restoration processing (Step S87).

[0071]In said tablet collection processing, as shown in the flow chart of drawing 24, the tablets which remain in the transportation vessel 46 and each hopper 44 are collected. First, the container supporter 76 is moved and the tablet container 11 with the largest capacity is located under the restoration hopper 97 (Step S91). Usually, since the tablet container 11 of maximum capacity is prepared for the container supporter 76, this tablet container 11 is used for it, but

when not prepared, the tablet container 11 of maximum capacity is supplied from the stock container 51. On the other hand, the transportation vessel 46 recovers a tablet from any one of the common guide passages 31 (Step S92), and it collects from injecting hopper 94 grade to said tablet container 11 via the restoration hopper 97 (Step S93). And the tablet container 11 filled up with the tablet is transported to the chamber houses 6 of the storage rack 1 by the arm member 15, and (Step S94) the thing of the same size as the transported tablet container 11 is supplied to the container supporter 76 (Step S95). It is displayed on the indicator 7 as "P000" (Step S96), and distinction of filling up with the tablet collected to the tablet container 11 transported to the chamber houses 6 is enabled at a glance.

[0072]Hereafter, said tablet container 11 with the largest capacity similarly used for the container supporter 76 from the stock container 51 is supplied, and the tablets which remain from the common guide passage 31 are collected. In this case, although that in which a tablet does not remain is also contained in the common guide passage 31, in order to grasp thoroughly which tablet there is in the middle of conveyance, recovery efforts of a tablet is performed from all the common guide passages 31.

[0073]Thus, if the tablets which remain from all the common guide passages 31 are collected (Step S97), the tablet containers 11 of other sizes held at the container supporter 76 will be collected (Step S98). In this case, about the tablet container 11 of size which collected from the container supporter 76 and was kept in the chamber houses 6 of the storage rack 1, the container supporter 76 is supplied from the stock container 51 applicable each time (Step S99).

[0074]Then, by indicating the touch panel 12 a main menu and pressing "AUTO", if the recovery efforts of a tablet is completed (Step S100), The return to said empty container provisioning process (Step S2) which is usual similarly, tablet transfer processing (Step S3), and tablet filling treatment (step S4) is enabled.

[0075]In said restoration processing, when a tablet filling apparatus carried out an abnormal stop, the data under processing memorized in the memory by certainly turning off the power supply of the control section 5 was cleared, but it may be made to make a worker choose whether this data is used. That is, it may be made to continue by, for example, carrying out pressing operation of the "RECALL" displayed on the touch panel 12 as it is using the data under processing before an abnormal stop, without turning off the power supply of the control section 5. In this case, recovery of the tablet container 11 left behind to the empty container transportation part 53 and the container supporter 76 grade and the tablet left behind to the common guide passage 31 grade is unnecessary.

[0076]Although it was made to perform the display which shows recovery of "P000" uniformly to the indicator 7 of the chamber houses 6 used for recovery in said restoration processing, it is preferred to enable it to indicate whether to be the tablet discharged from which feeder

container 36 in addition to the display which shows recovery. That is, it is specified whether it is the tablet which collects tablets from which common guide passage 31, memorizes that with the transportation vessel 46, is based on the memory content, and was discharged from the feeder container 36 of the gap. In this case, although judgment by a being [it / which feeder container 36]-among feeder containers 36 which aligned up and down furnace cannot be performed, if the data under processing is used last time, it is also possible to specify whether it is the tablet discharged from which feeder container 36.

[0077]The specific tablets (for example, a pyrine medicine, the histamine agent which causes an allergic reaction, etc.) which must not be mixed to other patients are also contained in the tablet stored to said tablet feed zone 2. Therefore, when filling work is performed via a common course, there may be a danger that a specific tablet will mix in other tablets according to the fault of a device, etc. For this reason, it is preferred to form an individual expenditure device in each tablet feed zone 2 which accommodates a specific tablet, respectively.

[0078]This individual expenditure device is provided with the tablet storing section 200 which makes the tablet supplied from the motor base 32 store temporarily as shown in drawing 27. LED201 is provided in the front face of the motor base 32. This LED201 is turned on when a tablet is stored by the tablet storing section 200 from the motor base 32. The lower end opening part of the tablet storing section 200 is opened and closed by the shutter 203 supported by the opening-and-closing supporter 202 pivotable considering the pivot 203a as a center. The shutter 203 has the circular notch 204 formed in front sides, and it protrudes the detection piece 205 on the side edge. The notch 204 is for stopping the flange of the tablet container 11 to the common-law marriage, and positioning to it so that pushing is possible. The detection piece 205 is detected by the sensor 206 formed in the opening-and-closing supporter 202 at the time of closing of the lower end opening part of said tablet storing section 200 by the shutter 203. The shutter 203 is energized so that energizing means, such as a spring which is not illustrated, may close the lower end opening part of the tablet storing section 200.

[0079]In the tablet feed zone 2 provided with the individual expenditure device of said composition, if the motor base 32 drives based on formula indicative data and a specific tablet is stored by the tablet storing section 200, LED201 will light up. Thereby, the worker can specify at a glance whether the specific tablet with which it is going to fill up from which tablet feed zone 2 was discharged. Then, a worker sets the tablet container 11 in the individual expenditure device of the tablet feed zone 2 which LED201 has turned on. That is, where the tablet container 11 is positioned to the notch 204 of the shutter 203, it pushes in. Focusing on the pivot 203a, the shutter 203 resists the energizing force by said energizing means, and is rotated. And when the upper opening of the tablet container 11 is open for free passage to the lower end opening part of the tablet storing section 200, the tablet container 11 is filled up with the specific tablet in the tablet storing section 200. At this time, when the sensor 206 will be in

a non detection state about the detection piece 205 of the shutter 203, LED201 goes out.
[0080]
[Effect of the Invention]Since it had composition which supports the flange of a tablet container with the supporter of a container support member according to the tablet filling apparatus concerning this invention so that clearly from the above explanation, structure can be simplified and it can create cheaply.

[0081]Since it had the label stuck part which sticks a label on a peripheral face by guiding and rotating a tablet container, a dead space can be used effectively and an option can be obtained with compact composition.

[0082]moreover -- since the supporter was formed at a different interval according to the difference in the size of a tablet container supplied from a tablet container feed zone, it can respond to various tablet containers by slight improvement -- a design -- it can respond easily and cheaply.

[0083]The tablet supplied from the tablet feed zone is stored in a tablet filling portion, and you can make it filled up with a tablet since the tablet container which upper-**(ed) by the hoisting member is filled up, structure being easy and controlling an occupancy space.